

REMARKS

Claims 1-60 are currently pending. Claims 1, 5, 6, 7, 8, 16, 24, 35, 44 have been amended to clarify them. Claim 55 has been amended to correct a minor typographical error. Claims 20 and 59 have been rewritten in independent form. Applicants respectfully request reconsideration of the application in response to the non-final Office Action.

Allowable Subject Matter

Applicants gratefully acknowledge the indication by the Examiner that claims 20-23, 59, and 60 would be allowable if rewritten in independent form including all of the limitations of the base claims and intervening claims. In accordance with the Examiner's indication, claims 20 and 59 have been rewritten in independent form to include all of the limitations of the base claims, claims 1 and 44, respectively. These amendments are made solely to expedite prosecution, and do not represent acquiescence by Applicants to any rejections.

Claim Rejections – 35 U.S.C. §103(a)

Claims 1-19 and 35-43 have been rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Leuchs et al. (US 5,172,185) and in view of Kachanov (US 5,543,916).

In rejecting claims 1 and 35, the Office has stated that "Leuchs et al. show a device for determining the wavelength of laser light comprising: an optical device...Leuchs only shows two photo detectors and that [*sic*] the comparator 'in the simplest case' (column 4, lines 13+) and does not show that the wavelength is calculated. Kachanov shows an interferometer for determining wavelength wherein the interferometer uses two point sources of light similar to Leuchs' fiber ends to create an interference pattern...At the time of the invention, one of ordinary skill in the art would have modified Leuchs with Kachanov's CCD detector and computer in order to obtain more information regarding the wavelength...." Applicants respectfully disagree.

The Leuchs et al. patent discloses systems for stabilizing the wavelength of a laser diode in air. As depicted in FIGS. 1 and 2 of the Leuchs et al. patent, input

laser beam is directed via two optical paths to two output ports, wherein the beams emitted from the output ports make an interference pattern. Then, two photo detector units merely develop signals commensurate with the spatial fringe pattern at two points of the interference pattern, and the signals are fed back to the laser diode forming a feedback-type wavelength control system. However, there is nothing in the Leuch et al. and Kachnov patents that would teach fundamental differences of the presently claimed invention.

Specifically, the presently claimed invention, as recited in claims 1 and 35, relates to an apparatus that operates based on an optical path difference between two optical paths within the waveguide. In contrast, if any optical path difference would exist between the two optical paths within the waveguide of the Leuchs et al. system, the spatial fringe pattern would be affected by the temperature of the waveguide or substrate 17. As a consequence, the spatial fringe pattern cannot be used to control the air wavelength of the laser diode unless the effects of the additional parameters are compensated. The Leuchs et al. patent does not include any measure to compensate the effects, which therefore requires that the two optical paths of the Leuchs et al. system have the same optical path length. The Kachnov patent is silent as to the "first optical length difference" and "two waveguide paths of different optical length" as recited in claims 1 and 35, respectively. A review of the cited references reveals that there is no teaching in any reference that would motivate a skilled artisan to combine the teachings of any one or more of the cited references to arrive at Applicant's invention. As such, Applicants respectfully submit that the cited references, taken individually or in combination, do not teach or suggest all the limitations of the claimed invention, and that claims 1 and 35 are patentable. Since claims 2-19 and 36-43 are proper dependent claims depending from patentable independent claims 1 and 35, respectively, they are also patentable.

To further differentiate the present claims from the cited references, claims 1 and 35 have been amended and respectively include recitations "the two output ports are located in a common plane normal to the direction of propagation of the central rays emitted therefrom" and "having two exit ports that are located in a plane normal to the direction of propagation of the central light rays exiting from said exit ports." Support for the change can be found in the specification, page 3, paragraph

[0009] and FIG. 2, for example. It is noted that the Kachanov patent discloses a system having two imaginary sources that do not lie in the same plane normal to the direction of propagation of the central light rays emitting from the sources. Also, the systems depicted in FIGS. 3-4 of the Leuchs et al. patent do not have the two output ports located in a common plane normal to the direction of propagation of the central rays emitted therefrom.

In rejecting claim 10, the Office has stated that "one of ordinary skill in the art would have optimized for the proper working range of knowing the relationship of the fringe spacing to the wavelength...as is known by the teaching of Young...." Applicants respectfully disagree.

It appears that the Office has viewed the two apertures of Young's interferometer to correspond to the two output ports of the presently claimed invention. As is well known in the art, Young's interferometer has two apertures that transmit two light beams, wherein the two light beams have the same phase at the apertures. In contrast, claim 10 is directed to an apparatus that includes two optical paths having an optical length difference therebetween, wherein the optical length difference is a physical length difference of about 2.33 mm. Thus, two light beams that respectively pass through the two optical paths and thence exit through the two output ports would have a phase difference commensurate with the optical length difference. As such, Applicants respectfully submit that Young's interferometer is not a relevant prior art for the apparatus that claim 10 is directed to.

The Office has cited the Leuchs et al. and Kachanov patents in rejecting claim 24. Again, Applicants respectfully submit that the cited references fail to teach or suggest "two waveguide paths of different optical length" as recited in claim 24. Furthermore, as in the case of claim 1, a recitation "having two exit ports that are located in a plane normal to the direction of propagation of the central light rays exiting from said exit ports" has been added to claim 24 so as to further differentiate claim 24 from the cited references. As such, Applicants respectfully request that the rejection of claim 24 be withdrawn. Claims 25-34 depend from claim 24, rendering them also patentable for at least the same reasons.

Claims 44-58 have been rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Leuchs and Kachnov as applied to claim 1 above, and further in view of Snyder (US 4,173,442).

This rejection is predicated on the erroneous characterization of the Leuchs et al. and Kachanov patents, and is respectfully traversed, as pointed out above. Furthermore, claim 44 has been amended to include "the two output ports are in a common plane normal to the direction of propagation of the central light rays emitted therefrom." Accordingly, Applicants respectfully submit that the rejection of claim 44 and its dependent claims, claims 45 - 58, lacks foundation and must be withdrawn. Also, based on the same reasons set forth above to address the rejection of claim 10, Applicants respectfully request that the rejection of claim 50 be withdrawn.

Conclusion


Based on the reasons as set forth above, Applicants respectfully request allowance of all pending claims.

In the event that there are any questions concerning this paper, or the application in general, the Examiner is respectfully urged to telephone Applicants' undersigned representative so that prosecution of the application may be expedited.

Respectfully submitted,

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